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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/146,851	09/03/1998	MARK MCQUEEN	3522US(97-10	9940

7590 06/19/2002

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EXAMINER

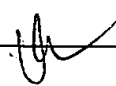
FENTY, JESSE A

ART UNIT	PAPER NUMBER
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2815

DATE MAILED: 06/19/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/146,851	MCQUEEN, MARK	
	Examiner	Art Unit	
Jesse A. Fenty	2815		

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 March 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-6,9,10,19,21-24,27 and 28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-6,9,10,19,21-24,27 and 28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Prosecution Application

1. The request filed on 03/14/02 for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) based on parent Application No. 09/146,851 is acceptable and a CPA has been established. An action on the CPA follows.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 3-6, 9, 10, 19, 21-24, 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pan (U.S. Patent No. 6,854,127) in view of Huang et al. (U.S. Patent No. 6,084,304).

In re claim 1 and 19, Pan (Fig. 6) discloses a semiconductor device comprising:

A single contact plug (22) extending through a first barrier layer (27) planarized own to a transistor gate member, said single contact plug in electrical communication with an active region of a semiconductor substrate (10); and

An individual contact land (60) disposed atop said single contact plug and a portion of said first barrier layer, wherein said contact land is wider than said single contact plug and is substantially planar.

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Pan does not expressly disclose an upper contact extending through a second barrier layer, said second barrier layer disposed over said first barrier layer, to form an electrical contact with said individual contact land. Joshi et al. (Fig. 6) discloses an upper contact (248) extending through a second barrier layer (246), to form an electrical contact with a lower, wider contact land (242). It would have been obvious for one skilled in the art at the time of the invention to improve upon the device of Pan in the manner of a more comprehensive interconnect structure as disclosed by Joshi for the purpose, for example, of providing a multi-level interconnect structure that will provide greater device insulation of the device active region yet provide the desired conductivity of Joshi to upper level devices.

In re claims 3 and 21, Pan (Fig. 6) discloses a semiconductor device, comprising:

An intermediate structure comprising a substrate having at least one active area including at least one implanted drain region (11), and at least one implanted source region (11), said intermediate structure further including at least one transistor gate member (21, 22, 25) spanned between said at least one drain region and said at least one source region on said at least one active area;

A first barrier layer (27) planarized over said at least one transistor gate member, said at least one active area and adjacent said at least one transistor gate member;

At least one drain contact plug (22) extending through said first barrier layer, wherein said at least one drain contact plug is in electrical communication with said at least one drain region on said substrate;

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At least one source contact plug (22) extending through said first barrier layer, wherein said at least one source contact plug is in electrical communication with said at least one source region on said substrate;

An individual drain contact land (60) disposed atop each of said at least one drain contact plugs and a portion of said first barrier layer, said individual drain contact land wider than said at least one drain contact plug and substantially planar; and

An individual source contact land (60) disposed atop each of said at least one source contact plugs and a portion of said first barrier layer, said individual source contact land wider than said at least one source contact plug and substantially planar.

Pan does not expressly disclose a second barrier layer with second source and drain contacts extending through said second barrier layer to establish communication with the source and drain contact lands. Joshi et al. (Fig. 6) discloses an upper contact (248) extending through a second barrier layer (246), to form an electrical contact with a lower, wider contact land (242). It would have been obvious for one skilled in the art at the time of the invention to improve upon the device of Pan in the manner of a more comprehensive interconnect structure as disclosed by Joshi for the purpose, for example, of providing a multi-level interconnect structure that will provide greater device insulation of the device active region yet provide the desired conductivity of Joshi to upper level devices.

Pan does not expressly disclose a field oxide layer. Joshi (Fig. 6) disclose such a layer (222). It would have been obvious to one skilled in the art at the time of the invention to use a field oxide layer in the device of Pan for the well known purpose of isolating one device from

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another in a semiconductor substrate, similarly referred to by Joshi as shallow trench isolation (Joshi; column 7, lines 41-43).

In re claims 4 and 22, Pan in view of Joshi disclose the devices of claims 3 and 21 respectively, further comprising drain contact metallization (upper 248) in electrical communication with said at least one upper drain contact; and source contact metallization (upper 248) in electrical communication with said at least one upper source contact.

In re claims 5 and 23, Pan in view of Joshi disclose the devices of claims 3 and 21 respectively, wherein said at least one source contact plug extends between at least two source regions.

In re claims 6 and 24, Pan in view of Joshi disclose the devices of claims 3 and 21 respectively, wherein said at least one drain contact plug extends between at least two drain regions.

In re claims 9 and 27, Pan in view of Joshi disclose the devices of claims 3 and 21 respectively, wherein said at least one upper source contact extends between at least two individual source contact lands.

In re claims 10 and 28, Pan in view of Joshi disclose the devices of claims 3 and 21 respectively, wherein said at least one upper drain contact extends between at least two individual drain contact lands.

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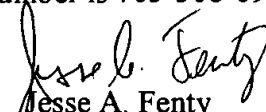
Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Huang et al. (U.S. Patent No. 6,084,304); Li et al. (U.S. Patent No. 6,075,293) and Hosotani et al. (U.S. Patent No. 5,977,583) disclose similar inventions to the claimed invention..

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jesse A. Fenty whose telephone number is 703-308-8137. The examiner can normally be reached on 5/4-9 1st Fri. Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on 703-308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-746-3892 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.


Jesse A. Fenty
Examiner
Art Unit 2815

JAF
June 16, 2002